THE PLANT DISEASE REPORTER

LIBRARY
RECEIVED
☆ JUN 11 1938 ☆
U. S. Department of Agriculture

Issued By

Division of Mycology and Disease Survey

Volume XXII Number 10

June 1, 1938

BUREAU OF PLANT INDUSTRY

UNITED STATES DEPARTMENT OF AGRICULTURE

THE PLANT DISEASE REPORTER

Issued by

THE PLANT DISEASE SURVEY

DIVISION OF MYCOLOGY AND DISEASE SURVEY

Vol. XXII Number 10

June 1, 1938

IN THIS ISSUE

Potato and tomato diseases in Dade County, Florida are reported by Geo. D. Ruehle, page 168.

Dry weather evidently prevented development of bean diseases in the Charleston area of South Carolina according to C. F. Andrus, page 171.

A. A. Dunlap reports that few diseases were observed on early vegetables in market gardens in Connecticut, page 172.

Shorter notes on vegetable diseases, page 173, include reports on downy mildew on peas in South Carolina, by C. F. Andrus, pea mosaic on Long Island, by H. S. Cunningham, a tomato fruit mottle in Texas, by P. A. Young, and virus diseases of lettuce in New York, by M. B. Linn.

Roderick Sprague contributes a note on diseases of cereals and grasses in Oregon and Washington, page 174.

Wheat leaf rust has caused severe damage in Georgia according to J. H. Miller reporting on diseases of small grains in that State, page 176.

Rusts and other diseases of cereals are reported from various States, page 178.

The recurrence of tobacco downy mildew is reported from New England and development of the disease in other States is described, page 181.

Red stele was found very generally in strawberry fields examined in Delaware, as reported by K. J. Kadow, page 184.

Dry weather at the critical period for infection was responsible for slight importance of fruit diseases in Illinois this year, according to H. W. Anderson, page 186.

Anna E. Jenkins reports on the distribution of Sphaceloma and Elsinoë in California, page 187.

Brief notes on plant diseases, page 188, include reports on quince rust on apple in Tennessee, by Paul R. Miller, and bacterial leaf spot on geranium in Oregon, by F. P. McWhorter, and a short statement calling attention to an article by C. L. Fitch on the Cobbler seed supply.

DISEASES OF POTATO AND TOMATO IN DADE COUNTY, FLORIDA DURING THE 1937-38 SEASON

Geo. D. Ruehle

POTATOES

Approximately 7500 acres of Bliss Triumph potatoes were grown in the district this past season, which was an increase of 1500 acres over the 1936-37 season. An unusually long, cool, relatively dry growing season during the winter months was favorable for the production of unusually high yields, for this section, where healthy seed stocks were planted. Poor seed was responsible for many low yields.

Spindling sprout. A serious seed-borne disease, variously called "spindling sprout", "hair sprout", or "purple-top wilt" was unusually prevalent in fields planted to seed stocks obtained from North Dakota, Minnesota, and Wisconsin. The purple-top symptoms noted in connection with the disease in North Dakota did not accompany the trouble under South Florida conditions.

Of the estimated 400 cars of seed shipped into the County this past season, approximately 275 were from North Dakota and 10 or 12 from Minnesota and Wisconsin. Practically all of this seed had been certified. From 15 to 65 percent of the tubers showed the disease in lots of seed from eastern North Dakota. Seed stocks from western North Dakota showed 2 to 10 percent infection, and lots from the central part of the State slightly more. Most of the North Dakota seed used in Dade County originated in the eastern and central portions of the State.

Reductions in yield from spindling sprout were greatest in the earliest planted fields. When the presence of the disease in Dakota seed became generally known, several of the larger growers planted more seed per acre than usual to overcome possible reductions of yield from this source. Increases of 4 or 5 bushels of seed per acre were common and this was probably a factor in maintaining high yields in the later plantings.

Where infection ranged from 10 to 50 percent or more, field losses from the disease were estimated at from 10 to 100 bushels per acre. In 930 acres covered by one survey, the estimated reductions in yield were 59,150 bushels. Approximately 5000 acres in Dade County were planted with seed in which from 2 to 65 percent of the tubers were affected with spindling sprout.

Late blight (Phytophthora infestans) was present for the third consecutive season. The disease first made its appearance early in January in a small field which had been planted with infected seed. The vines were neither sprayed nor dusted and were killed down rather quickly by the blight. The disease gradually spread to surrounding farms and by February 1 was generally well distributed over the entire district. Most of the acreage sustained very little damage from late blight, however, because infection took place late in the season when the vines were nearly mature, and dry weather at harvest time prevented more than a trace of tuber infection. On farms close to the field where the disease first put in its appearance, vine damage was considerable in spite of spraying or dusting with copper fungicides, and yields were reduced from 10 to 50 percent. Loss from late blight for the entire acreage was estimated at 3 to 4 percent.

Common scab (Actinomyces scabies) was widespread and caused increased damage this past season in spite of the more general use of one or more of the standard seed treatments. On farms showing a high percentage of scab infection in 1937, the disease was nearly as severe in 1938 although the seed had been treated, indicating that the organism was carried over in the soil.

Ordinarily, the land used for growing potatoes is more or less completely inundated during the summer months, and this flooding has been considered to be an important factor in killing out or at least reducing the units of the scab organism in the soil from one season to the next. During the summer of 1937, the potato land was not completely covered with water and this may explain in part the carrying over of the organism in this instance. In past seasons, scabby potatoes have been followed by a crop that showed very little infection.

Virus diseases. Leaf roll was much more common than in past seasons on farms that were planted to seed stocks originating in Maine and the Canadian provinces. In some fields 35 to 40 percent of the plants developed leaf roll and marked reductions in yield resulted. Western seed was practically free from this disease.

Rugose and mild mosaic were present in most fields in about the usual amounts. Most seed stocks showed 2 to 3 percent with an occasional lot showing 5 to 10 percent.

Witches broom was observed in a small lot of seed originating in Montana.

Early blight (Alternaria solani) caused little damage this past season. The cool growing season and the widespread use of copper sprays and dusts for the control of late blight were factors preventing serious development of Alternaria blight.

Rhizoctonia disease (Corticium vagum). The stem lesion phase of this disease gave little trouble, but the black scurf phase was more in evidence than in average years, particularly on tubers harvested late in the season. Because of unfavorable prices much of the crop was harvested several weeks after maturity and this delay favored the development of sclerotia very distinctly.

Bacterial wilt and soft rot. A bacterial wilt, accompanied by a soft rot of the tubers and probably identical with the disease described recently by Bonde in Phytopathology[1] was observed on several farms. The disease was confined chiefly to fields planted with New Brunswick seed stock where infection ranged from 2 to 5 percent. In a few instances, 10 percent of the plants were infected in low poorly drained spots in individual fields. An occasional specimen was observed on farms planted to Maine seed.

A field rot caused apparently by an unidentified species of Fusarium occurred on a number of farms. Soft rot bacteria were usually associated with the fungus and infected tubers brought to the packing-houses decayed very rapidly.

A dry rot was observed in packing-houses which was caused by a species of fungus (probably Armillaria mellea) producing black rhizomorphs. The fungus infects the potatoes by means of these rhizomorphs which run over the surface of the tubers. The disease has not been observed in the field and probably occurs only in isolated cases.

Bacterial soft rot (Bacillus carotovorus) was of little importance except as a secondary condition following other infections. Blackleg was observed as an occasional specimen in some fields.

TOMATOES

Approximately 10,000 acres of tomatoes were grown in the County during the season. The season was marked by an increase in the practice of staking the vines and by an increase in the use of airplanes for dusting this crop.

Tomato early blight (Alternaria solani) was the most serious fungus disease affecting the crop. The disease caused slight to moderate damage to the earliest plantings and increased in severity gradually as the season advanced. A severe outbreak occurred on late plantings of tomatoes shortly after potato harvesting operations were at their peak. The spores of the fungus are produced in abundance on dying potato vines and disturbing these vines during the harvesting of the crop is apparently a very efficient method of spreading the infection to the tomato fields.

1/ Bonde, Reiner. A bacterial wilt and soft rot of the potato in Maine. Phytopath. 27: 106-108. Jan. 1937.

Late in February, an outbreak of late blight (Phytophthora infestans) was observed in a small acreage of tomatoes near Goulds. The infection did not spread far and did very little damage except in this one field. The occurrence of late blight on this crop is very unusual for this area.

Wilt (Fusarium lycopersici) was a serious disease in the early pineland tomato crop, killing from 5 to 10 percent of the plants.

Considerable frost damage occurred during January in cold spots but most of the tomato acreage escaped injury from this cause.

Other diseases observed during the season, but of minor importance to the growing crop, were Phoma rot, bacterial scab, buckeye rot, and Stemphyllium leaf spot.

(Sub-Tropical Experiment Station, Homestead, Florida).

EARLY-SEASON BEAN DISEASES AT CHARLESTON, SOUTH CAROLINA

C. F. Andrus

An exceptionally good opportunity to observe symptoms of cold injury was had in April 1938, following near frosts on the 4th and 10th. Records were made of the character and extent of injury on a large number of varieties and unnamed introductions at the U. S. Regional Vegetable Breeding Laboratory. The outstanding symptom was a corrugation and bleaching of the leaves which produced a mottling. The bleaching was evidently related to the angle of sunlight reaching the leaf. Mottling on certain varieties had a remarkable resemblance to mosaic. Trifoliate leaves which were small at the time they were subjected to the near-frost temperature developed to their normal size and retained the mottling symptom up to the picking stage. Even the varieties most severely affected by cold in the seedling stage made excellent vegetative growth.

An exceptionally low incidence of disease occurred in the Charleston area, obviously because of the unusually dry season. Rust (Uromyces phaseoli typica) and blight (Bacterium phaseoli and B. medicaginis phaseolicola) were present in numerous, small but well distributed centers of infection, and either disease could have developed to epidemic proportions with only a few days of favorable weather. A few isolated infections of powdery mildew (Erysiphe polygoni) were observed. A very small percentage of plants in one plot were killed in the early pod stage by root rot (Sclerotium rolfsii). A survey of root rot in the pre-bloom

stage revealed about 90 percent freedom from root infections; the remaining 10 percent suffered mostly mild injury due to Fusarium and Rhizoctonia. Mosaic (virus) was abundant on especially susceptible varieties such as Refugee, but there appeared to have been little secondary spread, owing possibly to the small insect population which was indicated also by the comparative freedom of the foliage from insect feeding injuries.

(Division of Fruit and Vegetable Crops and Diseases, U. S. Regional Vegetable Breeding Laboratory).

DISEASES OF EARLY VEGETABLES IN CONNECTICUT

A. A. Dunlap

A survey of the larger market gardens in Connecticut during May disclosed relatively few diseases, with rather dry weather prevailing. Most outstanding were two lettuce troubles. Mosaic of lettuce was found occurring in nearly all fields of New York varieties and to a less extent in Romaine. In some fields, 25 percent or more of the plants showed mosaic symptoms - mottling, leaf corrugation, and whitening of the veins. Other fields of New York lettuce showed only 2 or 3 percent of mosaic infection. Because of the earliness of the crop and the absence of insects on the plants, it would seem that the virus was present in the seed. Some of the infected plants were stunted but many of them were growing to a fairly normal size and the growers do not anticipate a marked loss from mosaic.

The other disease of lettuce was a decay of the stem at the soil line. No particular fungus was found consistently in the stem lesions and a few growers believed the trouble to be carried over from slight seed-bed infections (possibly Rhizoctonia) which developed further on plants under unfavorable conditions in the field. In most cases only a small number of plants were affected but in two fields an alarming number of plants had badly decayed stems.

A few cabbage plants were observed which appeared as if attacked by maggots but upon examination no maggot injury was found. The stem below the ground, however, was shriveled and showed black discolorations. An Alternaria was found on most of the plants - most likely representing seed-borne infection.

In a small planting of perennial onions at Middletown, downy mildew (Peronospora destructor) was found on May 16.

Downy mildew (Peronospora effusa) of spinach was found in about half of the fields observed and in two of these considerable damage had occurred.

(Connecticut Agricultural Experiment Station).

SHORTER NOTES ON VEGETABLE DISEASES

DOWNY MILDEW ON PEAS IN SOUTH CAROLINA: Downy mildew (Peronospora viciae) was observed March 25, in field plots of the U. S. Regional Vegetable Breeding Laboratory at Charleston. Although it is not unusual for downy mildew to occur on peas in South Carolina, this instance seems to deserve record since it occurred during a period of near drought, only .33 inch precipitation being recorded for Charleston in March. The downy mildews are expected to require excessive moisture and comparatively low temperature. Temperatures in the Charleston area were favorable for development of the disease but there was a rainfall deficiency of 2.69 inches for March and an accumulated deficiency of 4.91 inches from the first of February. The fungus developed luxuriantly on a few plants but failed to spread extensively onto adjoining ones, and in April it was difficult to find any evidence of the disease. (C. F. Andrus, Division of Fruit and Vegetable Crops and Diseases, U. S. Regional Vegetable Breeding Laboratory).

PEA MOSAIC ON LONG ISLAND: Pea mosaic has made its appearance in the pea plantings on Long Island. At the present time peas are just coming into bloom. Surveys in Nassau County showed that from 20 to 50 percent of the plants were showing characteristic symptoms. In Suffolk County the peas are not quite so far advanced as in Nassau County and in the Suffolk County fields only scattered plants were found showing mosaic symptoms. None of the fields examined were free from mosaic. Aphids are present but not abundant. (H. S. Cunningham, May 19, New York State Agricultural Experiment Station).

TOMATO FRUIT MOTTLE IN TEXAS: Many tomatoes in one field showed a disease newly recognized in this, Cherokee, County. The green fruits showed prominent, large, dark green blotches and irregular bands as much as 2 cm. long, especially prominent near the stem end of the fruit. This appeared to be a mosaic disease, and usually was associated with prominent interveinal mild mosaic type of mottling of the leaves. I suspect that this is a new disease. (P. A. Young, May 17, Texas Agricultural Experiment Station Tomato Disease Laboratory, Jacksonville).

VIRUS DISEASES OF LETTUCE IN NEW YORK: In Richmond County neither mosaic nor big vein of lettuce is as prevalent this spring as in the past. The total amount of infection for the two will average less than 2 percent. (M. B. Linn, Weekly News Letter, May 16).

NOTES ON DISEASES OF CEREALS AND GRASSES IN OREGON AND ADJACENT COUNTIES IN WASHINGTON DURING THE SPRING OF 1938

Roderick Sprague

In western Oregon during the past winter leaf growth was favored by a number of prolonged periods of open and moist weather. Leaf spotting fungi and soil-borne fungous parasites have been active during the late winter and spring.

Take-all (Ophiobolus graminis Sacc.) is beginning to appear (May 1-10) particularly in Polk, Linn, Benton, and Marion Counties, Oregon. In the wheat seed treatment plots in Benton County (Granger station) take-all covers a large portion of the plots notwithstanding the fact that the land had been continuously in orchard for a generation.

Septoria tritici Rob. on wheat (race 1-Oregon) and on oats (race 2-Oregon) was very widespread in late winter in the Willamette Valley in Oregon and in Klickitat County, Washington, destroying a considerable portion of the leaf surface of the rosettes. Secondary infection continues to develop on the shooting culm sheaths and leaves at Corvallis but the drier weather since mid-April has effectively checked the worst attack. Septoria annua Ell. and Ev. was very common on the winter bluegrass (Poa annua) near Corvallis and affinities of S. annua were prevalent on range bluegrass (P. secunda, P. scabrella, etc.) in Klickitat County.

Scolecotrichum graminis Fckl. caused a scorch or streak on about 40 percent of the leaves in a field of rye (Secale cereale) near Alsea, Oregon in early May. This is only the second time that this fungus has been seen on rye in Oregon. It is, however, always common on various grasses. This year it is particularly prevalent on orchard grass, tall meadow oat grass, Poa compressa, Bromus carinatus, and Elymus glaucus.

Barley scorch (Rhynchosporium secalis (Oud.) J. J. Davis) was as usual very destructive on barley and it was also present in the plots at Granger, Oregon on rye.

Septoria passerinii Sacc. was found May 10 on Hordeum nodosum near Corvallis, but the fungus has not been found on cultivated barley in Oregon for a number of years.

The white footrot and eye spot (Rhizoctonia sp.) of wheat was found May 10 in the Willamette Valley six miles south of Monroe, Oregon in Lane County. This is the first time it has been seen outside of the coastal region. Apparently what is the same fungus was found also on Bromus carinatus about 15 miles southwest of the wheat field. The disease on the brome grass was confined to a sheath spot.

Cercosporella footrot (C. herpotrichoides Fron) appeared in late winter on High Prairie, Klickitat County, Washington but drying winds, cool and rainless weather prevented serious injury as was first feared. Loss will be average or above, however, because of the excessive leaf growth of last winter.

The frog eye spot (Mastigosporium calvum (Ell. & Davis) Sprague) which was formerly found only in the coastal region or adjacent parts was widespread throughout the Willamette Valley on bent grasses (Agrostis tenuis, A. palustris and A. alba). It was found in lawns at Corvallis as well as pastures and roadsides from Lane County, Oregon, north into Clark County, Washington. The same fungus (but a distinct race or group of races) on Dactylis glomerata was also found across the Willamette Valley into the foothills of the Cascades and in the coast region was present on most of this grass seen. The fungus is a distinctly active parasite and of major importance on these grasses.

The red leather leaf disease (Pseudodiscosia avenae Sprague & Johnson) on winter oats was almost as common as barley scorch on barley. The disease attracted considerable attention on oats in fields near Corvallis which to the Sunday passerby were beautifully pigmented. The disease appears to be increasing in abundance from year to year and must be recognized as one of the common if minor leaf spots of this region. As soon as the humidity decreased in mid-April, as it did this past month, the fungus quickly disappeared but the injury was apparent for some time. In severe spots the grain appeared to be somewhat stunted.

A small amount of leaf rust (Puccinia triticina Erikss. = P. rubigo-vera tritici (Erikss. & Henn.) Carl.) is already present on wheat in Benton County. On High Prairie, Klickitat County, leaf rust was noted on winter wheat last October in fields seeded about September 7. This is the only time this rust has been noted on wheat seedlings in the fall in that area. The rust had disappeared by March of this year.

(Division of Cereal Crops and Diseases, May 12).

DISEASES OF SMALL GRAINS IN GEORGIA

J. H. Miller

WHEAT--- A survey has been made this spring in northeast Georgia from Gainesville to Clayton and through Hart and Elbert Counties down to Lincolnton and back to Clarke County. Five trips have been completed over this area in March, April, and May. In addition an inspection trip May 12 to Sparta and Sandersville and another May 14 and 15 south to Tifton, were made.

The weather in this part of Georgia has been uniformly mild with the exception of an early cold wave in November. Rainfall has been below normal for most of the winter and spring.

Leaf rust, caused by Puccinia triticina [P. rubigo-vera tritici], appeared later than usual and it was April 15 before traces could be found in the northeast sections. This attack developed very slowly until about April 25, but between then and May 1 it had reached epidemic proportions and had destroyed everything but the top leaf and it was partially gone. At present wheat here is in the early dough stage and only a small part of the stem is green. The loss of all the leaves in the milk stage should result in about 15 to 20 percent decrease in yield.

South of Athens to Macon and towards Sandersville, May 12 to 15, all wheat seen was affected to about the same extent as that north of here. There is very little difference in the stage of wheat and the amount of rust between Cornelia and Macon. However, below Macon, in Houston, Crisp, and Dooly Counties, much of the acreage was mature and all green areas were heavily rusted.

Near Sparta, on the farm of Mr. George Gilmore, 300 acres of wheat showed little damage from rust, since most of the leaves were already dead from drouth and winter injury when the attack developed. At Sandersville, the writer inspected 1200 acres of wheat on Mr. Thomas Gilmore's farm. This crop was much more vigorous, the entire field standing nearly waist high. It was in the milk stage about the last of April when the leaf rust peak was reached, and most of the leaves died within a ten-day period.

Soon after the leaf rust became prevalent, Mr. Gilmore noticed spots of stem rust (Puccinia graminis f.), and when the writer arrived May 12, the entire 1200 acres was 100 percent infected with the latter. Uredo-sori were up to the head on every stalk. There were several infection centers in which the wheat was completely destroyed. The loss from both rusts will be at least 50 percent for the entire field.

Last year this farm was inspected by Dr. H. C. Murphy (Plant Disease Reporter 21:193, 1937) and he found no traces of stem rust. It is difficult to explain the heavy attack this year unless infection took place after Dr. Murphy's visit and the rust overwintered in the heavily infected spots. No stem rust was seen north or west of the Gilmore farms May 12, but on May 18, with wheat almost mature, traces of stem rust were appearing in all fields near Athens, but too late to do any damage. This is the usual situation and the writer has never before seen stem rust in Georgia as serious as on the Gilmore farm.

The varieties grown in Georgia are chiefly soft winter wheat and forms of Blue Stem. That on the Gilmore farms was Coker's Red Heart. These varieties seem to be about equally susceptible.

On the agronomy plots at Athens, Georgia Red, Gasta, Alabama Blue-Stem, Cherokee Light, Georgia Rust Proof, Common, Red Heart, and Purple Straw Club have been from 65 to 95 percent infected, in the order named. Orlando, Dietz Mediterranean, Mammoth Red, Stoner, C.I.5977, Purple Straw 19, Fulcaster, and Wharten have shown very little rust. These are chiefly late varieties, but still show much less rust than the former group when in the same developmental stages. Wharten is a rye-wheat cross and is the most resistant of the varieties mentioned to both leaf and stem rust. However, it is a genotype mixture and has segregated on rust resistance as well as early and late maturity.

Loose smut of wheat (Ustilago tritici) was seen in most of the fields but in the majority there was less than one percent.

OATS--- Leaf rust (Puccinia coronata) last year almost completely destroyed many varieties of oats in south Georgia and caused serious loss in northern parts of the State. This year, however, only the smallest traces have been seen in any field, even in varieties that were completely susceptible last spring. Also, last year Dr. Murphy estimated the loss on 400 acres of Coker's Full Grain on the Gilmore farm to be 30 percent, but on about the same date this year, this field showed less than 1 percent infection. Only a few low spots with vigorous plants were heavily infected. No stem rust was seen on oats.

Loose smut (Ustilago avenae) was found in all fields inspected, with an average loss of about 1 to 2 percent. The Full Grain oat on the above farms with no treatment showed almost no smut. It is highly resistant. The greatest amount of smut was found in a forty-acre field near Buford, at least 10 percent of the plants being affected.

(University of Georgia).

REPORTS ON RUSTS AND OTHER DISEASES OF CEREALS[1/]

TEXAS: College Station. The cereal rust situation has grown continually worse in southern Texas throughout the month of April. In the cereal nurseries at Beeville, Angleton, and College Station susceptible varieties of wheat and oats that were not destroyed by the leaf rusts in March are now broken down by stem rust. Many of the Hope x Mediterranean selections that are known to have mature plant resistance carried heavy infections of stem rust on the upper leaves and sheaths at the time of heading.

Nearly all oat fields of south-central and southwestern Texas of varieties other than those of the Texas Red group were destroyed by crown rust by the middle of April. Stem rust of oats has now made its appearance in epidemic form in the same areas of the State. Varieties of the Texas Red group that had successfully resisted the crown rust epidemic are now being attacked and severely injured by stem rust. Most of the fields of Texas Red, south of a line running from Navasota to Uvalde, are so badly infested that the straw has started breaking down.

Leaf rust of wheat has been present in epidemic proportions in commercial fields of wheat throughout the State for a month or more and was resulting in considerable injury to the crop prior to the freezes of April 8 to 10. Much of the injury, now widely attributed to freezing, is probably due to a combination of leaf rust infection and whipping by the wind.

Stem rust of wheat, though present in small patches in most of the commercial fields from San Antonio to Temple, had not appeared in epidemic proportions in the main wheat-growing areas of the State up to May 1. It may, however, be present in small amounts in all wheat fields of the State with the possible exception of the Panhandle and High Plains.

High south winds for several days past have undoubtedly been carrying enormous numbers of spores of all of the cereal rusts into the grain fields farther north. Copious rains were received in the Black Lands from Temple to Dallas last night. These undoubtedly will be followed by heavy dews and thus contribute to favorable conditions for rust infections. (E. S. McFadden, May 4. Cereal Courier 30: 42, May 10).

Substation No. 6, Denton. (May 15) Weather during the first half of May has been very favorable for small grains and rather unfavorable for the spread of wheat stem rust. Minimum temperatures have been below 60° F. on 12 of the 15 days. The mean temperature for the first half of the month was 67° F. or 4° below normal. Precipitation amounted to.94 inch and was received in three showers. Dews occurred on 9 days. Seven days were partly cloudy.

1/ Two errors on the map in the preceding issue (Fig. 1, p. 152), should be corrected: Woodward is in northwestern Oklahoma almost directly north of Chillicothe, Texas. The date of first discovery of crown rust at Denton, Texas was April 4 instead of April 14 as given on the map.

The above weather conditions have permitted only a slow spread of stem rust. In the meantime wheat on farms has in most instances reached full head, and early fields of Fultz and Red May wheat have nearly reached maturity. Some harvesting will start this week. A large amount of inoculum of stem rust is being built up in this area but it seems at present that the majority of fields will escape serious damage. Very late maturing fields, and early infection centers of some fields will probably be damaged.

In the experimental plantings stem rust will damage very susceptible varieties and those late in maturity. Early varieties of wheat, except where injured by the April freeze, have matured a fine crop. Leaf rust continues to be a serious factor in growth of the wheat.

Fall sown oats have started to ripen. Spring sown oats are heading. Crown rust has spread rapidly and it appears now that spring oats will be damaged considerably. Stem rust has also appeared. Fall oats in commercial fields are exceptionally fine.

(May 23) Weather conditions during the past week have not been favorable for the further spread of stem rust, with the exception of the last two days. During the first part of the week the weather was clear, and no dews were recorded. During the last two days several showers have been received, and the sky has been partly cloudy so that moisture has stayed on the grain a large part of the time. Early varieties of wheat are maturing and some harvest has started in the eastern part of the county. The Mediterranean types of wheat, however, are in the soft to hard dough stage, and it will be June 1 before many fields are harvested. Wheat near stem rust centers as well as some other fields will produce shriveled grain and yields will be materially reduced. Although wheat in commercial fields looks good at this time, farmers will probably be disappointed in their yields because of rust damage.

Crown rust of oats continues to spread rapidly, and stem rust of oats is becoming generally distributed in the experimental plantings. In all probability, spring oats, which at this time are very promising, will be injured by both stem rust and crown rust. (I. M. Atkins, Division of Cereal Crops and Diseases).

OKLAHOMA: This summary of observations on wheat in Oklahoma is prepared for the Reporter at the request of Dr. K. Starr Chester with whom I visited grain fields in the central wheat-producing area of that State, and thence en route as far west as Woodward and southeast from Stillwater to Hugo, and north from Stillwater to the Kansas line. Everywhere the outstanding disease is leaf rust (Puccinia rubigo-vera tritici). The present appearance of the fields of both early and late wheat and the reports of growers indicate that the rust appeared early and had killed all but the uppermost leaves before the heads appeared. The upper leaves

were either entirely killed or if still green, badly rusted by the time the heads emerged from the boot. With the stalks defoliated the grain has had to depend upon the green heads, stems, and awns for carbohydrate production. As a result the heads are short and in many instances only one of a pair of grains has filled. Abundant soil moisture is prolonging the season and improving the yield since stem rust has become a factor in only a few fields. In many fields stem rust has not appeared and in most places where it was present only a trace was found. In one locality about ten miles south of Stillwater and in another about nine miles north, stem rust was doing appreciable injury in a few fields, while others in the same regions were nearly or quite free from it. With the harvest near at hand it hardly seems possible that stem rust can become serious.

Hail has done serious damage locally; early frost has caused a superficial discoloration of the nodes of some stems and perhaps a little injury, but the heads of such stems are generally as large and as well filled as those of uninjured ones. Speckled leaf blotch (Septoria tritici) was found here and there. Army worm and grasshopper injury was seen in scattered localities. With the leaves destroyed by rust the army worms were feeding directly on the heads, whereas, otherwise they would have attacked the leaves with less injury to the grain.

Wheat in Oklahoma is by no means a failure and the yields may be equal to or even above average but it may be conservatively estimated that leaf rust has reduced the potential yield from 30 to 50 percent. (H. A. Edson, May 28, Division of Mycology and Disease Survey).

KANSAS: Stem rust of wheat was found at Manhattan on May 11. Reports of its occurrence in Barber, Sumner, Saline, and McPherson counties were received on May 12. To date it remains difficult to find in fields and appears mostly as isolated primary pustules mostly on the flag leaves. With only one or two exceptions, the weather thus far in May has been too cool for the rapid development of stem rust. Rains and dews have been frequent and well distributed but temperature has been the limiting factor.

Leaf rust infection is extremely heavy in nearly all parts of the State and undoubtedly is causing a loss in yield. The loss probably will be underestimated owing to favorable moisture conditions which will raise the general yield level.

Loose smut is severe in some fields and in general seems to be considerably more abundant than in 1937.

At the present moment the poor condition of many fields in south central Kansas is very striking. This seems to be due largely to a

combination of spring frost injury and heavy leaf rust infection. (C. O. Johnston, Division of Cereal Crops and Diseases, May 21).

NEBRASKA: 2/

ARKANSAS: Rice Branch Station, Stuttgart. Weather conditions have been rather unusual so far this year. The rainfall since January 1 has been 24.45 inches, or approximately 9.00 inches above normal. The temperatures have also been high. The average daily temperature for March was 62.4, or 10° higher than normal. These conditions have caused oats and fruits to be much earlier than usual.

Oats started heading 10 days to 2 weeks earlier than normal, and crown rust also appeared 2 weeks earlier than normal. The common oats, such as the Lee and Winter Turf varieties, are so severely infected with crown rust that yields will be almost nil. The more resistant varieties, such as strains of Red Rustproof, are only slightly infected at this time. Nearly all oats grown commercially in this section are of the Red Rustproof type, so the loss from this disease is not expected to be very great. (C. R. Adair, Apr. 23. Cereal Courier 30: 41. May 10).

CALIFORNIA: The winter-sown small grains in the Sacramento Valley are all in head now. In general, the yield outlook is not good, despite an abundance of soil moisture. Weeds (wild oats and mustard) are providing a lot of competition and growth is so lush that lodging will probably be severe. Many spots have not yet recovered the normal green color after enduring prolonged saturation. Barley scald [Rhynchosporium secalis] continues to ravage susceptible varieties, but despite its abundance it has not been found on any wheat varieties. Barley scald and septoria of wheat have severely attacked culms and glumes of many varieties. Net blotch (barley) [Helminthosporium teres] is developing fast now. Leaf rusts are abundant on both wheat and barley; but despite its over-wintering here stem rust has not yet appeared on other than volunteer plants. Crown rust of oats is fairly abundant on both the cultivated and wild species. Foot rots on both wheat and barley are especially bad in the Montezuma hills. (C. A. Suneson, Apr. 30. Cereal Courier 30: 46. May 10).

TOBACCO DOWNY MILDEW: APPEARANCE IN NEW ENGLAND AND DEVELOPMENT IN OTHER STATES

APPEARANCE OF DOWNY MILDEW AND ANGULAR LEAF SPOT IN MASSACHUSETTS: In a letter dated May 14, county agent W. T. Locke of Hampden County stated that on May 13 he identified downy mildew [Peronospora tabacina] in a bed in the town of Agawam. He stated further that, "Subsequent visits to twenty other tobacco beds in Agawam, Southwick, and Westfield, disclosed no other infections."

2/ In a letter received after stencils for this number were cut R. W. Goss reported the finding of stem rust on wheat at Lincoln, May 30.

This finding came close after a report from Dr. P. J. Anderson that he first observed the disease this year on May 12 in three rather widely separated beds in Connecticut.

County agent Locke also reported a case of the angular leaf spot [Bacterium angulatum] in a Southwick bed on May 7. (O. C. Boyd, May 17. Massachusetts State College).

CONNECTICUT: P. J. Anderson reports that he found the first case of downy mildew on May 12 which was 14 days ahead of first appearance last year. (E. E. Clayton, Division of Tobacco and Plant Nutrition).

DEVELOPMENTS IN NORTH CAROLINA: A mild outbreak of downy mildew (Peronospora tabacina) on tobacco occurred in the central and upper Piedmont counties of North Carolina during the last ten days of April. This outbreak followed a general rainy period on April 15. This rainy period was followed by hot, dry weather until May 14, when general rains again occurred. A survey made of the area during the week of May 9 to 14, revealed that approximately 40 percent of the beds had been attacked by the parasite. However, the plants had recovered quickly with no kill and only slight damage to the foliage. Transplanting was begun in the area about May 1, and was essentially completed by May 20, which was fully two weeks ahead of normal. It is evident from the above that more than one-half of the tobacco farmers in Piedmont North Carolina were able to transplant their crop this year with plants that had not been attacked by downy mildew, and that the remaining growers generally had an adequate supply of recovered plants before the normal date of transplanting.

Reports of active downy mildew have just been received from a few of the mountain counties where burley tobacco is grown (May 24). (Luther Shaw, North Carolina Extension Service).

SEVERE DAMAGE IN SOUTHERN MARYLAND: E. A. Walker reports that downy mildew has caused very severe damage in the southernmost part of the Maryland tobacco producing area. Many beds had practically all the plants killed. In the northern counties the disease has not been severe as yet. (E. E. Clayton).

THE EARLY OUTBREAK OF DOWNY MILDEW IN MIDDLE TENNESSEE: The following situation was found in connection with a trip to Robertson County on April 20. Tobacco blue mold [downy mildew] was found on April 18 in Davidson County and on April 19 in Robertson County. Only scattered beds were affected in the dark fired district, but weather conditions were very favorable for an epidemic. After talking with Mr. Guthrie, county agent, it was decided to cover the county quickly and give instructions as to means of handling the disease to all interested growers, so that

in event conditions became worse immediate action could be taken in sufficient time to be effective. Accordingly representatives from each district of the county were called and the situation was explained. The nature of the disease and methods of control were described, and a detailed description was given for preparing and applying spray materials. The district representatives decided to hold ten demonstrations in their communities at which time instruction would be given in preparing spray materials and applying to the beds. The first demonstration was held on the twenty-second. (J. O. Andes, Tennessee Agricultural Experiment Station).

DOWNY MILDEW IN MIDDLE TENNESSEE: A second outbreak of blue mold [downy mildew] has recently occurred in middle Tennessee following the cool, windy and rainy weather starting about May 12. During a survey of beds May 16 to 19 the disease was found in all of the numerous beds examined in Wilson, Sumner, Davidson, Robertson, Montgomery, and Cheatham Counties. It is probably present in every bed of burley and dark-fired tobacco in Middle Tennessee.

Some beds have been seriously injured, others not, up to the present time. Owing to an early season a large percentage of the acreage was set out the first two weeks in May ahead of the second downy mildew outbreak. However there has been much setting during the past week with plants from beds in which the disease is active. Many fields were observed set with plants showing downy mildew on the oldest leaves and for the most part the plants had taken hold under the favorable soil and weather conditions and started to grow. In only one field, in Wilson County, was there seen any spread of the disease in the field to the newly developing leaves.

In many of the earliest inspected beds the disease has already run its course and the plants have practically recovered. Although setting out plants from beds in which the disease is still active is generally regarded as an unsafe practice many farmers have been doing it with apparent success to date.

A considerable percentage of growers have been spraying, first with Bordeaux for wild-fire control and later in the season with the red copper oxide spray for downy mildew. Much of the spraying has been done with inadequate apparatus however and in most cases there has been an insufficient number of applications. In general sprayed beds seem to be better than the unsprayed especially when a good sprayer developing 100 pounds pressure was used and where the applications were frequent and well timed.

Two beds and fields were observed where the growers had applied a combination copper and arsenic dust on the dealer's recommendation and

had burned the plants. There were small, dark lesions on the stems at the ground level or at the point of leaf attachment. When such plants were set out they died and much resetting was necessary. (R. H. Milton, Tennessee Agricultural Experiment Station and R. J. Haskell, United States Bureau of Plant Industry).

SPREAD OF DOWNY MILDEW IN KENTUCKY: Downy mildew has gradually spread over the Burley area of Kentucky. It appeared in scattered beds following a cool wet week. Setting is unusually well advanced all over the State so that losses will probably be slight. The evidence for carry over in old beds is slight. (W. D. Valleau, May 21. Kentucky Agricultural Experiment Station).

STRAWBERRY DISEASES IN DELAWARE

K. J. Kadow

Red Stele (Phytophthora sp.)

April 26: Arley Taylor, Farmington, has about 1-1/2 to 2 acres of Luptons and Blakemores, planted last year on soil said never to have cropped strawberries before. Three-fourths of the plants are now dead. The plants were from the Walters farm. Walters got his plants from Selders.

Andrew Walters, Farmington, has had about 3 acres of berries but had plowed under about half because of the red stele disease. The remaining half was also badly diseased. He was growing Luptons and Blakemores.

John Selders, Farmington, has a small patch (about 2 acres) with about a 50 percent loss from the red stele disease.

Elmer A. Tull, Farmington, has about 4 acres. Red stele has caused about 10 percent dying but was just getting started.

J. H. Myer and Son, Bridgeville, lost 12 acres last year with a disease thought to be red stele. He found a few spots of the disease in his new plantings. The losses are not large in these new beds yet.

Cape cod dwarf (crown nematode [Aphelenchoides fragariae]) was found by Dr. J. R. Christie of the U. S. Department of Agriculture in a few plants.

May 6: Herman Wooden, Delmar, has 5 acres with several small spots of red stele on low lands. The losses are not large as yet. Varieties are Blakemore and Lupton.

Mr. Hudson, Frankford, has 3-1/2 acres of Lupton and Blakemore. The disease is present but not causing heavy losses yet, not over 5 percent.

West Brothers, Dagsboro, have 18 acres of Lupton and Blakemore. E. B. West had 8 acres with only a few spots of red stele. Sam West had 10 acres, of which 5 acres were a total loss and the other 5 acres were 50 percent loss. Another 5 acres were plowed under last fall becuase of red stele. No berries were picked from the patch. Many of the plants came from Hudson at Frankford. (T. F. Manns).

Ernest Warrington, 2 miles northwest of Bridgeville, has 10 acres of Dorset, Blakemore, and Lupton. The entire patch to be plowed under because of combined losses from red stele, strawberry weevil, hail, and Blakemore yellows [leaf variegation].

Harvey Warrington, Dublin Hill, has about 12 acres which he intends to plow under for the same reason as his brother Ernest. He lost a small patch last year. The description sounds like red stele.

May 7: Harry Cordrey, Pittsville, has 3 acres. Red stele has killed about one-third.

Arley Cordrey, Pittsville, has 4 acres and red stele has taken about one-third.

Charles Barssure, Pitsville, has 5 acres. About one-third of the plants are killed.

Clarence Barssure, Pitsville, has 4 or 5 acres. In some patches the disease is very bad. About one-half of the total acreage is dead.

Other Diseases

May 6: Paul Lowe, Pitsville, has 3-1/2 acres with considerable dying in spots but typical root rot complex.

May 7: Ben Shockley, Dublin Hill, has 8 acres of strawberries with lots of Blakemore yellows and a little Cape Cod dwarf - not important.

Joe Allen, Bridgeville, has 5 acres with some Blakemore yellows.

F. C. Hill, Bridgeville, has 4 acres with no red stele but lots of Blakemore Yellows.

George West, Cannon, has some yellows in Blakemore.

Buck Adams, Cannon, has 10 acres of strawberries with some Blakemore yellows.

(Delaware Agricultural Experiment Station).

NOTES ON FRUIT DISEASES IN ILLINOIS

H. W. Anderson

Apple scab. In southern and western Illinois apple scab [Venturia inaequalis] is of minor importance at this time owing in part to the unusually dry period which extended over the last three weeks of April and into May.

Orange rust [Gymnoconia peckiana] of blackberries is unusually prevalent throughout the State. In the region where wild plants occur, the disease is so prevalent that large areas show nearly 100 percent infection.

Peach leaf curl [Taphrina deformans] was of very little importance throughout the State and caused no commercial damage even where no dormant spray had been applied.

Fire blight [Bacillus amylovorus] in the form of mild twig blight on pears appeared at Urbana about May 10.

Fabraea leaf spot [F. maculata] was observed at Urbana on May 15, but the spots were well advanced at this time.

Cherry leaf spot [Coccomyces hiemalis] has not yet appeared to any extent and since the fruit is almost full size, there is little danger of injury. Heavy rains the past few days (May 18-24) may result in a severe post harvest infection.

Relation of April and May weather to disease. In general dry weather prevailed from April 19 to May 18. When rains occurred, they were of short duration. Since the season was about two to three weeks ahead of normal this dry period occurred at a critical time so far as fruit diseases were concerned. For this reason most fruit diseases, with the exception of orange rust of blackberry, are of minor importance this spring.

(May 24. University of Illinois).

DISTRIBUTION OF SPHACELOMA AND ELSINOË IN CALIFORNIA

Anna E. Jenkins

There are now at hand fifteen records of Sphaceloma and Elsinoë in California. Four species are represented as follows: E. ledi on Labrador-tea (Ledum glandulosum), five records in two counties[1/], [2/]; E. veneta on Cory Thornless blackberry (Rubus canadensis), one record[3/]; S. rosarum on rose (Rosa), with six records from each of six counties,

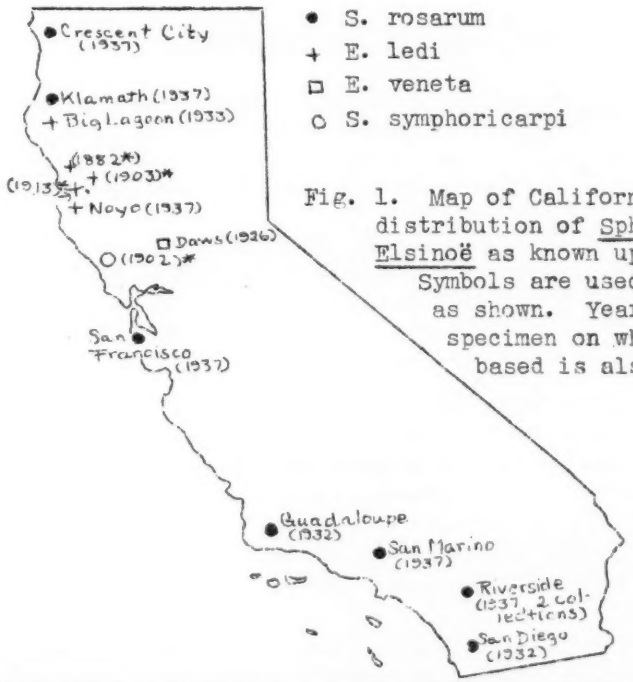

Fig. 1. Map of California showing the distribution of Sphaceloma and Elsinoë as known up to 1937. Symbols are used for each species as shown. Year of collection of specimen on which record is based is also given.

1/ Jenkins, Anna E. Additional records of species of Elsinoë and Sphaceloma. Mycologia 25: 213-220. 1933.

2/ Jenkins, Anna E. New records of anthracnose of Labrador-tea (Elsinoë ledi) and of snowberry (Sphaceloma symphoricarpi). Phytopath. 28: 374-375. 1938.

3/ This record of Elsinoë veneta is available in the files of the Plant Disease Survey and the specimen is in the Mycological Collections of the Bureau of Plant Industry.

and two records from Riverside County[4], [5], [6]; S. symphoricarpi on snowberry (Symphoricarpos albus var. laevigatus), one record[7]. For convenience of reference the counties in which these fungi have been found are indicated on the accompanying map of California (Fig. 1). There is also given on the map the date of collection of the phanerogamic or mycological herbarium specimen on which the record is based and where known the place where the material was gathered. An asterisk marks the four specimens collected as phanerogamic herbarium specimens. Collectively the specimens were gathered from May to August.

(Division of Mycology and Disease Survey).

BRIEF NOTES ON PLANT DISEASES

QUINCE RUST ON APPLE IN TENNESSEE: About 5 percent of the Staymans and 2 percent of Delicious were found to be infected with quince rust (Gymnosporangium clavipes) in a twenty-acre orchard near Jackson. (Paul R. Miller, May 18. Division of Mycology and Disease Survey).

BACTERIAL LEAF SPOT OF GERANIUM IN OREGON: F. P. McWhorter sent a specimen of bacterial leaf spot caused by Bacterium erodii on greenhouse grown geraniums from Eugene, April 5, with the comment "This is the first time in several years that we have seen specimens of this leaf spot in this State."

THE COBBLER SEED SUPPLY OF THE UNITED STATES: Under this title C. L. Fitch of the Iowa Agricultural Experiment Station discusses the factors affecting the quality of Cobbler seed from various sources in the United States and Canada. Freedom from virus is the most important qualification. In this respect the long-time virus-free Prince Edward Island stock is far ahead of that from any other source. (Fitch, C. L. The Cobbler seed supply of the United States. Amer. Potato Jour. 15: 91-98. Apr. 1938).

4/ Jenkins, Anna E. Distribution of rose anthracnose in California. U. S. Bur. Plant Indus. Plant Disease Rptr. 21: 316-317. 1937.

5/ Massey, L. M. In Plant Disease Reporter Suppl. 85, p. 74. 1933.

6/ Subsequent to the finding of S. rosarum at Riverside, Riverside County referred to in 4/, the fungus was again collected (August, 1937) in another locality at Riverside, by Prof. H. S. Fawcett.

7/ See footnote 1/.